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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,275	06/20/2003	Siyu Ye	130109.502	6444

500 7590 02/09/2006

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EXAMINER

YUAN, DAH WEI D

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 02/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/601,275

Applicant(s)

YE ET AL.

Examiner

Dah-Wei D. Yuan

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10282003</u> . | 6) <input type="checkbox"/> Other: ____. |

**METHOD OF MAKING A MEMBRANE ELECTRODE ASSEMBLY FOR
ELECTROCHEMICAL FUEL CELLS**

Examiner: Yuan

S.N. 10/601,275

Art Unit: 1745

February 6, 2006

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-4,10,13 are rejected under 35 U.S.C. 102(e) as being anticipated by Kosako et al. (US 6,977,234 B2).

With respect to claims 1 and 13, Kosako et al. teach a method of making a membrane electrode assembly for a fuel cell comprising providing a first gas diffusion layer (10), provide a one-sided catalyst (6) coated membrane (2), providing a gas diffusion electrode having a second catalyst layer (14) and bonding the three layers to form a membrane electrode assembly. See Embodiment 1; Figures 2 and 3.

With respect to claim 2, the two bonding steps occur simultaneously. See Figure 3.

With respect to claim 3, the catalyst layer further comprises a polymer electrolyte of a sulfonic acid-containing ionomer. See Column 19, Lines 34-50; Figures 12 and 13.

With respect to claim 4, Kosako et al. teach the second catalyst layer is an anode catalyst layer.

With respect to claim 10, Kosako et al. teach the gas diffusion layer and the catalyst layer are hot pressed at 150°C. See Column 25, Lines 12-20.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kosako et al. as applied to claims 1-4,10,13 above, and further in view of Oh et al. (2003/0108781 A1).

Kosako et al. disclose a method of making a membrane electrode assembly as described in Paragraph 2 above. However, Kosako et al. do not teach or suggest the addition of polytetrafluoroethylene in the catalyst layer. Oh et al. teach a method to make a membrane electrode assembly, wherein 20 wt% of PTFE is added to the catalyst layer. See Example 1. It is well known in the art that the use of PTFE in the catalyst layer can prevent the wetting of the catalyst particles. Therefore, it would have been obvious to one of ordinary skill in the art to add 20 wt% of polytetrafluoroethylene into the catalyst layer of Kosako et al., because it is well known in the art the PTFE can improve the hydrophobicity of the catalyst in the catalyst layer.

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kosako et al. as applied to claims 1-4,10,13 above, and further in view of Yoshida et al. (US 2003/0091891 A1).

Kosako et al. disclose a method of making a membrane electrode assembly as described in Paragraph 2 above. Kosako et al. teach the catalyst layer comprises conductive carbon particles of Ketjen black carbon. See Example 1. However, Kosako et al. do not teach or suggest the addition of acetylene carbon black in the catalyst layer. Yoshida et al. teach the catalyst composition comprises carbon powder selected from the group consisting of furnace black, acetylene black, thermal black, channel black, and Ketjen black. See Paragraph 22. Therefore, would have been obvious to one of ordinary skill in the art to substitute an acetylene carbon black for the Ketjen black carbon in the membrane electrode assembly disclosed by Kosako et al., because Yoshida et al. teach the two are considered functionally equivalent conductive carbon powders.

6. Claims 11,12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kosako et al. as applied to claims 1-4,10,13 above.

The disclosure of Kosako et al. differs from Applicant's claims in that Kosako et al. do not describe the sintering step at 330 to 420°C. It is well known in the art the higher the hot pressing temperature better the bonding strength between the two layers. Therefore, it would have been obvious to one of ordinary skill in the art to increase the hot pressing temperature to between 330 to 420°C, because one of ordinary skill in the art would recognize that higher hot pressing would promote bonding between the two dissimilar materials. In addition, it is the position of the examiner that disclosure provides no evidence of criticality with regard to the sintering temperatures.

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With respect to claim 12, the disclosure of Kosako et al. differs from Applicant's claims in that Kosako et al. do not describe the application of an ionomer solution to the surface of the catalyst layer after the sintering step. Kosako et al. teach the user of perfluorocarbon sulfonic acid ionomer can improve proton conductivity and reduce internal resistance. See Column 29, Lines 27-41. Therefore, it would have been obvious to one of ordinary skill in the art to an ionomer solution to the surface of the catalyst layer after the sintering step, because Kosako reference teaches the resulting proton conductivity can be enhanced and the internal resistance can be reduced.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (571) 272-1295. The examiner can normally be reached on Monday-Friday (8:00-5:00).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dah-Wei D. Yuan
February 6, 2006



DAH-WEI YUAN
PRIMARY EXAMINER